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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor:	AUFDERHEIDE, Brian		
Application No.:	10/686,141	Group Art Unit:	2871
Filed:	October 15, 2003	Examiner:	Rude, Timothy L.
Title:	PATTERNED CONDUCTOR TOUCH SCREEN HAVING IMPROVED OPTICS		

APPELLANTS' BRIEF ON APPEAL

Mail Stop: Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This Brief is presented in support of the Notice of Appeal dated November 9, 2007, from the rejection of Claims 1-13, 20-24, 26, 28, 32, 34, 35, 37 and 38 of the above-identified application, as set forth in the Office Action mailed August 13, 2007.

The fee required under 37 CRF § 41.20(b)(2) for filing an appeal brief should be charged to Deposit Account No. 50-0996.

I. REAL PARTY OF INTEREST

The Real Parties of Interest are 3M Company and 3M Innovative Properties Company, each Delaware corporations.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences known to Appellants, the Appellants' legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal for the above-referenced patent application.

III. STATUS OF CLAIMS

Claims 1-13, 20-24, 26, 28, 32, 34, 35, 37 and 38 are pending and are the subject of this Appeal (Appendix 1, Claims). Claims 14-19, 25, 27, 29-31, 33 and 36 have been withdrawn, and are not the subject of this appeal.

Claims 1-13, 20-24, 26, 28, 32, 34, 35, 37 and 38 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,386,219 (Greanias) in view of U.S. Patent No. 6,583,935 (Saif).

IV. STATUS OF AMENDMENTS

All amendments to the claims and specification have been entered.

V. SUMMARY OF THE INVENTION

Appellants' invention relates to patterned conductor touch screens and methods of making patterned conductor touch screens, and in particular to patterned conductor touch screens constructed to reduce the visibility of the patterned conductors by increasing light transmission through the patterned conductor areas.

Independent claim 1 recites a touch screen that includes a substrate (*see, e.g.*, substrate 110 shown in Fig. 1, and accompanying description), a coating covering the substrate (*see, e.g.*, coating 120 shown in Fig. 1, and accompanying description), a transparent conductor pattern disposed on the coating (*see, e.g.*, transparent conductor pattern 130 shown in Fig. 1, and accompanying description), the pattern leaving areas of the coating uncovered (*see, e.g.*, Fig. 1), and a filler material covering and contacting both the transparent conductor pattern and the areas of the coating uncovered by the transparent conductor pattern (*see, e.g.*, filler material 140 shown in Fig. 1, and accompanying description), with the refractive index of the coating being less than that of the substrate and less than that of the transparent conductor pattern.

Independent claim 28 recites a touch screen construction (*see, e.g.*, touch screen construction 100 shown in Fig. 1, and accompanying description) that includes a PET substrate (*see, e.g.*, substrate 110 shown in Fig. 1, and accompanying description disclosing that substrate 110 can be PET), a silicon oxide layer covering the PET substrate (*see, e.g.*, coating 120 shown in Fig. 1, and accompanying description disclosing that coating 120 can be silicon oxide), an array of parallel ITO bars disposed on the silicon oxide layer (*see, e.g.*, parallel bars 130 shown in Fig. 1, and accompanying description disclosing that the parallel bars can be ITO), and an optically clear pressure sensitive adhesive disposed over and covering the ITO bars, the optically clear pressure sensitive adhesive having a refractive index in the range of 1.4 to 1.8 inclusive (*see, e.g.*, filler material 140 shown in Fig. 1, and accompanying description disclosing that the filler material can be an optically clear pressure sensitive adhesive having the recited refractive index).

Independent claim 32 recites a touch screen that includes a touch screen construction (*see, e.g.*, touch screen construction 100 shown in Fig. 1, and accompanying description) that includes a transparent conductor patterned on a substrate (*see, e.g.*, transparent conductor pattern

130 on substrate 110 as shown in Fig. 1, and accompanying description), a first layer substantially covering the substrate and disposed between the transparent conductor and the substrate (*see, e.g.*, coating 120 shown in Fig. 1, and accompanying description), the first layer configured to increase visible light transmission through the touch screen in areas covered by the transparent conductor (*see, e.g.*, paragraph [0026] describing coating 120 shown in Fig. 1), and a second layer disposed to contact the transparent conductor in areas covered by the transparent conductor and to contact the first layer in areas uncovered by the transparent conductor (*see, e.g.*, filler material 140 shown in Fig. 1, and accompanying description), the second layer configured to substantially inhibit visible light reflections at contact interfaces between the first layer and the second layer (see, e.g, paragraph [0018]).

Independent claim 35 recites a method for reducing the visibility of a patterned transparent conductor in a touch screen by coating an undercoat material between a substrate and the patterned transparent conductor so that the undercoat material substantially covers the substrate (*see, e.g.*, substrate 110, coating 120, and pattered conductor 130 of Fig. 1 and accompanying description, as well as paragraphs [0040] through [0044]), the undercoat material having a refractive index that is less than that of the substrate and the patterned transparent conductor (*see, e.g.*, paragraph [0026]), and wherein the patterned transparent conductor leaves areas of the undercoat material exposed; and disposing a filler material over the patterned transparent conductor and exposed areas of the undercoat material (*see, e.g.*, filler material 140 shown in Fig. 1 along with the accompanying description, as well as paragraph [0049]), the filler material having a refractive index and thickness selected to reduce interfacial reflections of visible light in areas covered by the patterned transparent conductor (see, e.g, paragraph [0018]).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1-13, 20-24, 26, 28, 32, 34, 35, 37 and 38 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Greanias in view of Saif. Therefore, the single grounds presented for review is whether claims 1-13, 20-24, 26, 28, 32, 34, 35, 37 and 38 are patentable over Greanias in view of Saif.

VII. ARGUMENT

Appellant submits that the rejection is improper and should be reversed because it is based on a proposed combination of references whose teaching fail to correspond to each of the elements recited in Appellants' claims, because the Examiner has impermissibly used hindsight in finding a motivation to combine and modify the references in a way that would result in Appellants' invention, and because the Examiner has failed to consider the teachings of the references as a whole by impermissibly picking and choosing elements from the references.

A proper case of obviousness using a combination of references has not been stated unless all three of the following can be shown from the perspective of the skilled artisan: each of the elements recited in the claims are disclosed in the references; a motivation to make the proposed combination in a way that results in the claimed invention; and a reasonable expectation of success. None of these elements have been satisfied.

The Examiner rejects Appellants' claims as unpatentable over Greanias in view of Saif, arguing that it would be obvious to use one of the layers of an anti-reflective stack disclosed by Saif between the substrate and the patterned conductors disclosed by Greanias, and that sufficient motivation to make the proposed combination can be found in the Saif reference. Each of Appellants' claims recites a coating covering a substrate, a transparent conductor pattern over the coating, and a filler material covering the transparent conductor pattern and exposed portions of the coating. The proposed combination does not teach or suggest such a construction, and no reason has been provided as to why one of skill in the art would make the necessary modifications in the face of contrary teachings present in the references. Therefore, a proper case of obviousness has not been stated, and the rejection should be reversed.

Greanias discloses a touch sensitive overlay that includes a set of patterned conductive lines disposed directly on a substrate. The Examiner admits that Greanias does not disclose the claimed recitations of (1) a coating that substantially covers the substrate and disposed between the substrate and a pattern of transparent conductors, and (2) a coating between the transparent conductor pattern and the substrate having a refractive index less than that of the substrate and less than that of the transparent conductor pattern. In contrast to Greanias, Saif discloses a touch panel membrane having an anti-reflective stack of multiple layers, each of the layers being continuous over the substrate, and none of the layers being patterned. As understood by one of skill in the art, an anti-reflective stack of multiple layers such as disclosed by Saif derives its anti-reflective properties from the interaction between all the layers in the stack, not from any of the layers taken individually.

Appellant finds nothing in the cited references, whether taken together or individually, to teach or suggest a touch screen having a patterned transparent conductor disposed on a continuous coating covering a substrate so that areas of the coating are exposed, and then over-coating with a filler material. In recognition of this, the Examiner takes the position that one of skill in the art would seek to modify the construction disclosed by Greanias using one of the layers of the anti-reflective stacks disclosed by Saif (e.g., primer layer 5 shown in Figure 5A of Saif) as a continuous under-coating for positioning between the substrate and the patterned conductive lines in the Greanias construction. The Examiner argues that such a combination would be motivated by promoting adhesion and reducing reflections, as taught in the Saif reference. Appellant submits that the modifications required to make Appellants' claimed invention are not motivated, and that the combination that the Examiner argues is motivated by the teachings of Saif would not read on Appellants' claims.

One of skill in the art would recognize that the anti-reflective stack disclosed by Saif performs its function as a whole. As such, there is no reason to select individual layers Saif's anti-reflective stack for use in another construction in the manner proposed by the Examiner. Indeed, one of ordinary skill in the art would not expect the motivated function (i.e, that of reducing reflections) to be achieved from use of an individual layer or layers plucked from the stack of Saif and inserted into a different construction.

Appellant submits that the impermissible use of hindsight has colored the Examiner's interpretation of what would result if one of skill in the art were to be hypothetically motivated by Saif to reduce reflections from the patterned conductors of Greanias in the manner asserted. Clearly, Saif teaches that reflections can be reduced from touch-sensitive conductors by placing layers of the conductive material between layers of oxide materials to thereby form an antireflective stack. As such, the only logical construction that could result from the proposed combination of Greanias with Saif in accordance with the Examiner's stated motivation would be to pattern anti-reflective stacks to thereby form the conductors of Greanias. The Examiner conveniently ignores such a hypothetical construction because it would suffer the same deficiencies as the Greanias reference relating to lack of a continuous coating between the substrate and the patterned conductors. Instead of recognizing the logical conclusion of his own reasoning, the Examiner has merely articulated a motivation and then concluded that Appellants' claimed invention must result. This is a hallmark of hindsight.

Also with the benefit of hindsight, the Examiner has impermissibly and selectively interpreted the Saif reference by choosing a portion of the disclosed anti-reflective stack and inserting it between existing elements of Greanias without providing any basis for how, why or whether such a thing could be done. In so doing, the Examiner has selected only those portions of the references deemed supportive of the rejection while ignoring the teachings of the references as a whole, contrary to settled law as stated in the MPEP at 2141.02, "A prior art reference must be considered in its entirety, *i.e.*, as a whole, including portions that would lead away from the claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984)."

For these reasons, Appellant asserts that a proper case of obviousness has not been stated.

CONCLUSION

In view of the above, Appellant submits that the proposed combination fails to teach or suggest all the recited claim elements, that the Examiner has impermissibly used hindsight in determining that the references would be combined and modified improperly in an attempt to reach Appellants' invention, and that the Examiner has impermissibly failed to consider the teachings of the references as whole. Therefore, Appellant submits that the rejection of claims 1-13, 20-24, 26, 28, 32, 34, 35, 37 and 38 should be reversed for failing to satisfy the requirements for maintaining a rejection under Section 103. Favorable decision from the Board is requested.

Respectfully submitted,

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APPENDIX 1
THE CLAIMS ON APPEAL

Appealed—Claims 1-13, 20-24, 26, 28, 32, 34, 35, 37 and 38

1. (Original) A touch screen comprising:

a substrate;

a coating substantially covering the substrate;

a transparent conductor pattern disposed on the coating, the pattern leaving areas of the coating uncovered; and

a filler material covering and contacting both the transparent conductor pattern and the areas of the coating uncovered by the transparent conductor pattern;

wherein the coating has a refractive index that is less than that of the substrate and less than that of the transparent conductor pattern.

2. (Original) The touch screen of claim 1, wherein the filler material has a refractive index matching or nearly matching the refractive index of the coating.

3. (Original) The touch screen of claim 1, wherein the filler material is the same as the material of the coating.

4. (Original) The touch screen of claim 1, wherein the filler material comprises silicon oxide.

5. (Original) The touch screen of claim 1, wherein the filler material is an adhesive.

6. (Original) The touch screen of claim 1, wherein the substrate comprises plastic.

7. (Original) The touch screen of claim 1, wherein the substrate comprises polyester.

8. (Original) The touch screen of claim 1, wherein the substrate includes a hardcoat disposed on a surface opposing the coating.

9. (Original) The touch screen of claim 1, wherein the coating comprises silicon oxide.

10. (Original) The touch screen of claim 1, wherein the transparent conductor pattern comprises a transparent conductive oxide.

11. (Original) The touch screen of claim 1, wherein the transparent conductor pattern comprises indium tin oxide.

12. (Original) The touch screen of claim 1, wherein the transparent conductor pattern comprises a conductive polymer.

13. (Original) The touch screen of claim 1, wherein the substrate has a refractive index of about 1.6 to 1.7, the transparent conductor pattern has a refractive index of about 1.8 to 2.1, the coating has a refractive index of about 1.4 to 1.5, and the filler material has a refractive index of about 1.4 to 1.8.

20. (Original) The touch screen of claim 1 wherein the coating has a thickness selected to substantially reduce reflections of visible light in areas covered by the transparent conductor pattern.

21. (Original) The touch screen of claim 1, wherein the transparent conductor pattern comprises a plurality of parallel stripes.

22. (Original) The touch screen of claim 1, wherein the transparent conductor pattern is configured for connecting to controller electronics adapted to determine touch location from signals generated when a conductive touch implement is capacitively coupled to a portion of the pattern.

23. (Original) The touch screen of claim 22 being arranged so the touch implement is capacitively coupled to the transparent conductor pattern through the substrate.

24. (Original) The touch screen of claim 22 being arranged so the touch implement is capacitively coupled to the transparent conductor pattern through the filler material.

26. (Original) The touch screen of claim 1 configured to be disposed over an electronic display so that the display can be viewed through the touch screen.

28. (Original) A touch screen construction comprising:

a PET substrate;

an silicon oxide layer covering the PET substrate;

an array of parallel ITO bars disposed on the silicon oxide layer; and

an optically clear pressure sensitive adhesive disposed over and covering the ITO bars, the optically clear pressure sensitive adhesive having a refractive index in the range of 1.4 to 1.8 inclusive.

32. (Original) A touch screen comprising:

a touch screen construction comprising:

a transparent conductor patterned on a substrate;

a first layer substantially covering the substrate and disposed between the transparent conductor and the substrate, the first layer configured to increase visible light transmission through the touch screen in areas covered by the transparent conductor; and

a second layer disposed to contact the transparent conductor in areas covered by the transparent conductor and to contact the first layer in areas uncovered by the transparent conductor, the second layer configured to substantially inhibit visible light reflections at contact interfaces between the first layer and the second layer.

34. (Original) The touch screen of claim 32, further comprising an electronic display positioned for viewing through the touch screen construction.

35. (Original) A method for reducing the visibility of a patterned transparent conductor in a touch screen comprising:

coating an undercoat material between a substrate and the patterned transparent conductor so that the undercoat material substantially covers the substrate, the undercoat material having a refractive index that is less than that of the substrate and the patterned transparent conductor, and wherein the patterned transparent conductor leaves areas of the undercoat material exposed; and

disposing a filler material over the patterned transparent conductor and exposed areas of the undercoat material, the filler material having a refractive index and thickness selected to reduce interfacial reflections of visible light in areas covered by the patterned transparent conductor.

37. (Original) The method of claim 35, further comprising the step of forming the patterned transparent conductor.

38. (Previously presented) The touch screen of claim 32, wherein the first layer has a refractive index that is less than that of the substrate and less than that of the transparent conductor.

APPENDIX 2

WITHDRAWN CLAIMS – NOT ON APPEAL

14. (Withdrawn) The touch screen of claim 1, further comprising a second substrate disposed over the filler material.

15. (Withdrawn) The touch screen of claim 14, wherein the second substrate comprises glass.

16. (Withdrawn) The touch screen of claim 14, wherein the second substrate comprises plastic.

17. (Withdrawn) The touch screen of claim 14, wherein the second substrate comprises polyester.

18. (Withdrawn) The touch screen of claim 14, wherein the second substrate is bonded to the touch screen by an adhesive.

19. (Withdrawn) The touch screen of claim 18, wherein the adhesive is the filler material.

25. (Withdrawn) The touch screen of claim 22 being arranged so the touch implement is capacitively coupled to the transparent conductor pattern through a second substrate disposed over the filler material.

27. (Withdrawn) The touch screen of claim 1, further comprising a second substrate, a second coating substantially covering the second substrate, a second transparent conductor pattern disposed on the second coating to leave areas of the second coating uncovered by the pattern, and a second filler material covering and contacting both the second transparent conductor pattern and the areas of the second coating uncovered by the transparent conductor pattern.

29. (Withdrawn) The touch screen construction of claim 28 adhered to a second substrate through the optically clear adhesive.

30. (Withdrawn) The touch screen construction of claim29, wherein the second substrate comprises plastic.

31. (Withdrawn) The touch screen construction of claim 29, wherein the second substrate comprises glass.

33. (Withdrawn) The touch screen of claim 32, wherein the touch screen construction further comprises a second substrate disposed over the second layer.

36. (Withdrawn) The method of claim 35, further comprising the step of disposing a second substrate over the filler material.

APPENDIX 3

EVIDENCE

None.

APPENDIX 4

RELATED APPEALS AND INTERFERENCES

None.